REMARKS

Claims 1-27 are pending. Claims 1, 11-13 are independent claims. No new matter has been added. Claims 1, 7, 11-13, 19 and 23-27 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Yamamoto et al. (USP 4,883,834). Claims 2, 4-6, 14, and 16-18 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Yamamoto in view of Wycech (USP 5,755,486). Claims 3 and 15 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Yamamoto in view of Wycech and further in view of Kawasaki et al. (USP 5,782,730). Claims 8-9 and 20-21 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Yamamoto in view of Wycech and further in view of Rowland et al. (USP 4,692,513). Finally, Claims 10 and 22 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Yamamoto in view of Wycech and Kawasaki and Rowland and Bagga (USP 5,021,513). Applicants respectfully traverse these rejections.

Interview Summary

Applicants thank Examiner Patterson for granting their counsel an in-person interview on Wednesday, January 21, 2009, to discuss the merits of the pending application. The participants of the interview, including Examiner Patterson, and attorneys Kennedy and Ciesliga, discussed the claimed invention and the cited references, along with proposed amendments. Counsel for Applicants brought supporting materials to the interview for their arguments in favor of patentability. Applicants file this summary, at least in part, to make those materials evidence of record.

It was noted in the interview that this application has been on appeal twice. The first appeal was dated 12/1/06. No Examiner's Answer was filed. The second appeal was dated 3/6/08. No Examiner's Answer was filed. This extensive procedural history has been a great expense to Applicants. This is why Applicants expressed a desire to have their claims reviewed by a third party other than the instant Examiner. Accordingly, Applicants requested that a Supervisory Examiner be present for the interview and that if a third appeal is necessary, then the Examiner file

an Examiner's Answer to such third appeal so that the Board of Patent Appeals and Interferences could review the pending application. The Examiner denied Applicants access to a Supervisory Examiner during the interview that he granted, as was his right. The Examiner also indicated his belief that he would file an Examiner's Answer if the pending claims would be finally rejected and appealed for a third time.

Finally, no agreement with respect to the claims was reached by the participants.

35 U.S.C. § 102 Rejections

Independent claims 1 and 11-13 require, among other things, "*from about 20-30% by weight of an SBS block co-polymer; from about 5-20% by weight polystyrene; from about 0.5-5% by weight of a rubber; and from about 30-45% by weight of an epoxy resin.*" Yamamoto does not disclose the claimed ingredients in combination with one another as "arranged in the claim" as required by *Net MoneyIN, Inc v. Verisign, Inc.*, 545 F.3d 1359, 1369-1370 (Fed. Cir. 2008). As such, Yamamoto does not anticipate the pending claims.

Yamamoto discloses a primer composition essentially consisting of three components; including a resin obtained by graft-polymerizing a SBS block co-polymer, an epoxy compound, and a cross-linking agent. (Yamamoto Abstract). Yamamoto does not disclose polystyrene as a separate ingredient anywhere in the four corners of the patent, so it certainly does not disclose it in an amount of about 5-20% by weight. Accordingly, Yamamoto simply does not and cannot anticipate claims 1-27.

Furthermore, it is factually incorrect to say that because a composition is made up of *X* and *Y* that *X* and *Y* are also independently present along with that composition. This is because when *X* and *Y* form covalent bonds to one another, the resultant composition *X—Y* has properties that are different from *X* alone and *Y* alone. In simplified terms, in the pending claims, *X* is polystyrene, *Y* is polybutadiene and $(X—Y)_n$ is SBS block co-polymer. Polystyrene is different from SBS block co-polymer. For example, see the materials attached to this Response as Exhibit 1: excerpts from *Plastics Technology*, Processing Handbook & Buyer's Guide 2005/2006. In Exhibit 1, throughout

the catalog, various physical properties are listed for each of the polymers presented. Such properties include *melt flow rate*, *tensile strength*, and *flex modulus*. (Exhibit 1, e.g., pg. G-202). The properties of polystyrene are very different from those of SBS block co-polymer. For example, the melt flow rate of polystyrene listed under the "Blow Molding, Extrusion and Injection Molding" section ranges from 1.4-4 g/10 min. (Exhibit 1, pg. G-202). The melt flow rate of SBS block co-polymer listed under the "Blow Molding, Extrusion and Injection Molding" section ranges from 7.5-11 g/10 min. (Exhibit 1, pg. G-211). As one of skill in the art understands, this is a substantial difference in range for this property. In another example, the tensile strength for polystyrene ranges from 7-7.6 yield at 1000 psi (Exhibit 1, pg. G-202), and from 3-3.7 yield at 1000 psi for SBS block co-polymer (Exhibit 1, pg. G-211). These substantial differences in ranges demonstrate that just because SBS block co-polymer may have polystyrene as a building block, this does not mean that SBS will exhibit similar properties that polystyrene exhibits on its own.

The pending application claims polystyrene, as a separate ingredient, in combination with the SBS block co-polymer and other ingredients. As illustrated in the examples, the polystyrene is a homopolymer that is combined with SBS block co-polymer and other ingredients. Since Yamamoto does not disclose these ingredients as claimed, then Yamamoto does not anticipate these claims.

With regard to claims 11-13 and 23-27, the compositions are required to have certain compression strengths and certain percent expansions. These physical traits are not inherent in the disclosure of Yamamoto because Yamamoto does not disclose a composition identical to the claimed composition, for at least the reasons described above.

Withdrawal of the 35 U.S.C. § 102 rejection of claims 1, 7, 11-13, 19 and 23-27 is respectfully requested.

35 U.S.C. § 103 Rejections

A. No *Prima Facie* Case Made Because The Combination Of Yamamoto And Wycech Does Not Teach Or Suggest All Of The Elements Of Applicants' Claims

The Examiner has failed to present a *prime facie* case of obviousness because the cited references, Yamamoto and Wycech, fail to teach or suggest all of the claimed limitations, as required under *KSR v. Teleflex*. The Examiner makes the argument that Yamamoto teaches SBS block co-polymer together with polystyrene and rubber and epoxy resin in the claimed ranges of weight percent. This is inaccurate. Yamamoto does not teach or disclose polystyrene as a separate ingredient as described above. Wycech does not cure this defect as it also does not teach or disclose or even mention the term "polystyrene" in the patent.

B. Even If *Prima Facie* Case Made, Applicant Has Rebutted The *Prima Facie* Case

It is not obvious to combine these ingredients together in the particular weight percentages found in the claims. Indeed, Applicants have found that the relative weight percentages of SBS block co-polymer with polystyrene and epoxy resin are important, and when used in an expandable composition, bring about an unexpected result.

In particular, polystyrene acts a sponge for both SBS and epoxy resin. In other words, SBS and epoxy resin compete with one another for solubility in polystyrene. If too much SBS is included in the formulation, it displaces the epoxy resin from the polystyrene, and the resulting formulation does not have the desired traits for an expandable reinforcer composition that can adhere to the surface of a structural member. Similarly, if too little SBS is included, the expandable reinforcer composition does not have the desired mechanical properties, such as compressive strength. Thus, a specific balance is required among the claimed ingredients. The claimed weight percentages are balanced to prevent too much leaking of epoxy resin out of the formulation by controlling the amount of SBS in the formulation relative to the epoxy resin. None of the specific weight percentages among the distinctly claimed ingredients, or the ratio of weight percentages of the claimed ingredients, are taught or suggested by the combination of Yamamoto and Wycech.

Moreover, when the claimed formulation is expanded, Applicants achieved the surprising result that the particular combination of ingredients, in their relative amounts, led to a composition that both expanded to a high degree (80-220%) while maintaining such an unexpectedly high degree of compressive strength (at least about 1400 psi). (Specification, pg. 8, lines 9-19). As explained in earlier amendments and appeal briefs, this is surprising because one of skill in the art would expect that the more the composition expands, the less likely it would be able to maintain such a compressive strength. Applicants respectfully request withdrawal of the obviousness rejections of claims 2, 4-6, 14, 16-18.

C. The Combination Of Yamamoto, Wycech, Kawasaki, Rowland And Bagga Does Not Teach Or Suggest All Of The Elements Of Applicants' Claims

The Examiner rejected claims 3, 8-10, 15 and 20-22 under 35 U.S.C. §103 as allegedly being obvious over Yamamoto and Wycech, and in various combinations with Kawasaki, Rowland and Bagga. These rejections are respectfully traversed. For the reasons discussed above, which are hereby incorporated, Yamamoto and Wycech do not disclose all elements of independent claims 1 and 11-13, from which claims 3, 8-10, 15 and 20-22 ultimately depend. Combination with Kawasaki, Rowland and Bagga, alone or in combination, do not cure the deficiencies of Yamamoto, even if used in combination with Wycech. Thus, the combination of five independent references does not render obvious these claims. Accordingly, and for at least these reasons, Applicants respectfully request withdrawal of the obviousness rejections of claims 3, 8-10, 15 and 20-22.

CONCLUSION

In view of the above amendment, Applicants believe the pending application is in condition for allowance. Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-0013, under Order No. 65765-0085 from which the undersigned is authorized to draw.

Dated: February 23, 2009

Respectfully submitted,

Electronic signature: /Linda D. Kennedy/
Linda D. Kennedy
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RADER, FISHMAN & GRAUER PLLC
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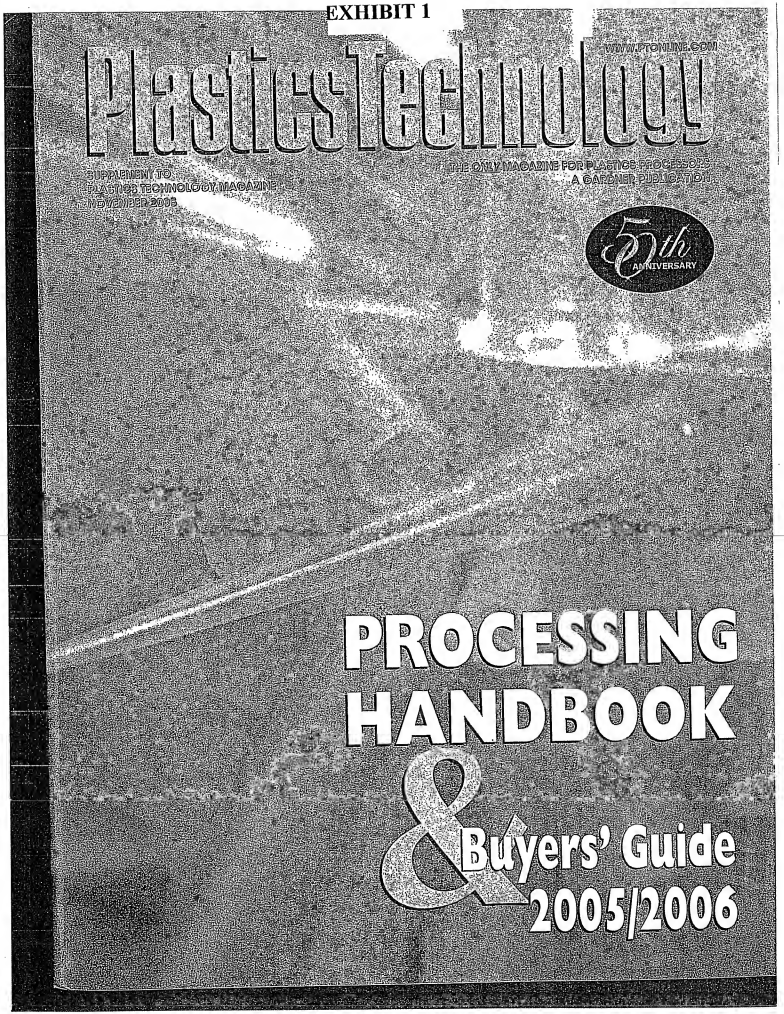
Attorney for Applicant

Enc. – Exhibit 1

EXHIBIT 1


Plastics Technology
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PROCESSING HANDBOOK
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2005/2006

PP/PE ALLOY (Continued)

INJECTION MOLDING (Continued)

Manufacturer	Trade Name and/or Grade	Features Applications	Type	Filler/ Reinf. Type	%	Melt Flow Rate, g/10 min	Density g/cc	Tensile Str at Yield 1000 psi	Elong. at Yield %	Flex Modulus 1000 psi	Notched Izod Impact ft-lb/in (J/m)	Deflection Temp. @ 264 psi
Schulman, A.	Polytrope TPP 504-31	CDI,MDL	–	–	–	2	0.92	2	–	0.5	–	–
	Polytrope TPP 508	PMT,HFL,AUT	–	–	–	6	0.91	2.5	–	0.8	–	–
	Polytrope TPP 510	COI,MDL	–	–	–	6.8	0.91	3	–	1	14.2	–
	Polytrope TPP 512	CDI,MDL	–	–	–	–	0.91	3.5	–	1.2	–	–

PP/PS ALLOY

BLOW MOLDING AND INJECTION MOLDING

Basell N.A.	Hivalloy G7066	HI	–	35% GF	10	1.2	12.7	–	8.8	2.5	315,286

INJECTION MOLDING

Basell N.A.	Hivalloy G-120	GP,HI,ST	–	–	5	0.94	4.8	6	2.2	2.9	200,140
	Hivalloy G-130	GP,HFL	–	–	25	0.93	3.7	7	1.7	2.5	190,130
	Hivalloy G-170	GP,HI	–	–	5	0.92	3.9	10	1.2	–	190,130
	Hivalloy G170	GP,HI	–	–	5	0.93	4.1	9	1.6	–	194,131
	Hivalloy G3058	IM,GP,HI	–	–	2	0.92	3	25	1.1	–	170,118
	Hivalloy G3067	GP,HI	–	–	5	0.91	3.6	7	1.7	–	190,130
	Hivalloy G3068	GP,HI	–	–	5	0.91	3.4	9	1.5	–	185,125
	Hivalloy G5064	GP	–	–	5	1.2	3.1	3	2.8	2.7	205,140
	Hivalloy G7055	IM,GP,HI	–	35% GF	11	1.18	9.5	4	6.3	6	310,265
	Hivalloy G7062	IM,GP	–	20% GF	9	1.06	6.8	–	5.7	3	295,215
	Hivalloy G7072	GP	–	35% GF	7	1.2	16.4	–	11	2	320,305

POLYSTYRENE—GENERAL PURPOSE

BLOW MOLDING, EXTRUSION AND INJECTION MOLDING

Manufacturer	Trade Name and/or Grade	Features Applications	Filler/ Reinf. Type	%	Melt Flow Rate, g/10 min	Density g/cc	Tensile Str at Yield 1000 psi	Elong. at Yield %	Flex Modulus 1000 psi	Notched Izod Impact ft-lb/in (J/m)	Deflection Temp. @ 264 psi
Amer. Polymers	API 370-21	GP,TRP,HR	–	–	2	1.05	–	–	–	0.4	320,0
Chevron Phillips	EA-3030	TF,TRP,HCR	–	–	3	1.05	7	–	4.4	–	5180
Dow Plastics	Styron 613	MED,TEN,TRP,HR	–	–	1.4	1.04	7.5	–	4.5	0.4	202,110
	Styron 623	MED,TRP,HR	–	–	4	1.04	7.3	–	4.5	0.4	203,129
	Styron 685	GP,MED,TRP,HR	–	–	2.2	1.04	7.6	–	4.7	0.3	206,562
	Styron 685D	GP,MED,TRP,HR	–	–	1.5	1.04	7.7	–	4.6	0.4	205,183
Ineos Styrenics	Polystyrene 166H	GP,TF,PKG	–	–	3.6	1.04	–	2	4.4	0.3	217,0
Total Petrochem.	Atofina 535	HR,HIT	–	–	4	–	7.4	–	4.5	–	–

BLOW MOLDING AND INJECTION MOLDING

Dow Plastics	Styron 666D	GP,MED,TRP,HR	–	–	8	1.04	6.5	–	4.6	0.3	186,172

EXTRUSION

Chevron Phillips	EA-3000	THR	–	–	1.8	1.04	8	–	4.4	0.4	197
	EA-3100	THR	–	–	3	1.05	7.8	–	4.4	0.4	195
	EA-3200	FCY,HR	–	–	7	1.04	7.4	–	4.3	0.4	195
Dart Polymers	GPPS PS-102	DS,HGL,TRP,HR	–	–	2.5	1.05	7	–	–	–	200
Huntsman Chemical	1983	GP,HI,CST	–	–	3.5	1.04	3.5	–	0.3	4	189
	201	GP,HMW,HIT,PKG	–	–	1.4	1.04	7.4	–	4.7	0.4	200
LG Chemical	20HR-E	HR	–	–	6	1.05	6.8	–	4.7	0.3	203,205

EXTRUSION (Continued)

Manufacturer	Trade Name and/or Grade	Features Applications	Filler/ Reinf. Type	Melt Flow Rate, g/10 min	Density g/cc	Tensile Str. at Yield, 1,000 psi	Elongation at Yield, %	Flex. Modulus, 1,000 psi	Notched Izod Impact, ft-lb/in. (1/8 in.)	Deflection Temp., F (66 psi) 264 psi)	UL 94 Rating (1/8 in.)
Nova Chemicals	2SSP-E	HI	–	2.8	1.05	7.1	–	4.7	0.3	208;207	HB
Nova Chemicals	2114	HI,PKG	–	2.3	1.03	4.9	–	3	2.6	;199	HB
Total Petrochem.	Atofina 523	HFL	–	11	–	6.5	–	4.8	–	–	–
	Atofina 5248	GP,HGL	–	9	–	6.7	–	4.5	–	–	–
	Atofina 585	–	–	1.6	–	7.6	1.1	4.3	–	–	–

EXTRUSION, SHEET

Dow Plastics	Styron 697	TRP	–	1.8	1.04	6.5	–	–	–		;218	–
Huntsman Chemical	1101LR	HMW,PKG	–	1.4	1.04	7.4	–	3	4.8	0.4	;200	–
Ineos Styrenics	Polystyrene 168MD	GP,LO,TF,HR	–	1.5	1.04	–	3	4.8	0.3	;201	–
Total Petrochem.	Atofina 819E	GP	–	2.6	–	5	55	3.4	2.2	–	–

EXTRUSION AND INJECTION MOLDING

Chevron Phillips	MC-3500	GP	–	8	1.05	7.6	–	4.6	0.4	;190	–
Dow Plastics	Styron 615APR	GP,TRP	–	14	1.04	6.4	–	4.5	0.3	191;168	HB
Huntsman Chemical	210	GP,HFL,BLN	–	38	1.04	4.9	2	0.4	0.4	;154	–
Ineos Styrenics	Polystyrene 145D	GP,HFL	–	14	1.04	–	2	4.4	0.3	;173	–
	Polystyrene 147F	GP,MFL	–	9	1.04	–	2	4.5	0.3	;185	–
	Polystyrene 148D	GP,MOL,PKG	–	6	1.04	–	2	4.5	0.3	;191	–
	Polystyrene 168 M	MED,TRP,HR	–	1.5	1.04	7.5	–	4.8	0.3	;201	HB
Nova Chemicals	1200/1204	MOL,TEN	–	1.6	1.04	7.6	–	5	0.4	;203	HB
	1210	HR,HMW	–	1.6	1.04	7.4	–	4.7	0.4	;200	–
	1220/1230	MOL	–	1.9	1.04	7.4	–	4.7	0.4	;200	–
	1280/1290	MOL	–	1.6	1.04	7.6	–	5	0.4	;203	HB
	1300/1301	MOL,HR,PKG	–	3.5	1.04	7	–	4.4	0.4	;200	HB
	1600	HR,MFL	–	5.5	1.04	6.8	–	5	0.4	;202	HB
	2100	ESC,HR,PKG	–	3.5	1.04	6.6	–	4.4	0.4	;180	–
	2110	MOL,HR,PKG	–	3.4	1.04	6.2	–	5	0.4	;195	HB
	2500/ 2504/2590	HR,BLN	–	7	1.04	5.5	–	5	0.4	;185	HB
	FX110	MOL,MLS	–	1.3	1.04	–	–	4.7	0.4	;205	–

INJECTION MOLDING

Amer. Polymers	API 390	GP,TRP	–	8	1.05	–	–	–	0.3	;190	–
	API 392	GP,TRP,HFL	–	12	1.05	7.8	–	4.5	0.3	;180	–
	API 395	GP,THR,HFL	–	18	1.05	14.6	–	3.6	0.3	;180	–
Chevron Phillips	MC-3100	THR	–	3	1.05	7.8	–	4.5	0.4	;193	–
	MC-3600	HFL	–	13	1.05	7	–	4.5	0.4	;179	–
	MC-3700	FR	–	19	1.05	6	–	4.5	0.4	;173	–
Dart Polymers	GPPS PS-108	HSI,TRP,MFL,OP	–	8	1.05	6.5	–	–	–	;190	HB
	GPPS PS-118	FCY,TRP,HFL	–	18	1.05	5.5	–	–	–	;162	HB
Delta Polymers	GPPS-108	GP	–	8	1.04	–	–	4.5	0.4	–	–
Dow Plastics	Retain PS-4000	RM,PKG,PCR	–	5.5	–	3.8	–	3.3	1	;188	–
	Styron 612	GP	–	9	1.04	6.7	–	4.6	0.3	203;186	–
	Styron 666APR	GP	–	8.5	1.04	7	–	4.7	0.3	200;179	HB
	Styron 695	GP,TRP,HR	–	1.5	1.04	7.5	–	4.5	0.4	210;184	HB
Federal Plastics	FPC 2	GP	–	3	1.05	–	–	–	0.3	;200	–
	FPC 3	GP	–	11	1.05	–	–	–	0.3	–	–
	FPC 4	GP,THR	–	4	1.05	–	–	–	0.3	–	–
	FPC 5	GP,TRP,MFL	–	12	1.05	7.5	–	–	–	–	–
	FPC 6	GP,HFL	–	22.5	1.05	6	–	–	–	–	–
	FPC 7	GP,TRP	–	7.5	1.05	–	–	–	0.3	;168	–

POLYSTYRENE—IMPACT *(Continued)*

INJECTION MOLDING *(Continued)*

Manufacturer	Trade Name and/or Grade	Features, Applications	Filler/ Reinf. Type	%	Melt Flow Rate, g/10 min	Density, g/cm³	Tensile Stress at Yield, 1000 psi	Elong. at Break or Yield, %	Flex. Modulus, 10E5 psi	Notched Izod Impact, ft-lb/in (1/8 in)	Deflection Temp. F, 66 psi (4.6 kg/cm²)	Deflection Temp. F, 264 psi (18.5 kg/cm²)
Hunstman Chemical	879	GP,CST	–	–	3.5	1.04	7.2	–	4.5	0.4	–	200
	880	COL,GP,HI	–	–	3.5	1.04	3	50	2.4	3.2	–	180
Ineos Styrenics	Polystyrene 446 C	MI,GP	–	–	14	1.04	3.1	–	2.4	1.2	–	192
LATI USA	Lastirol RV0	FR,HI,HFL	–	–	0.5–0.6	1.18	4.4	2	2.9	1.5	–	144
	Lastirol RV2	DS,FR,HI,HFL	–	–	0.2–0.4	1.09	5.8	2	4	1.3	–	169
LG Chemical	403AF	FR,WTR	–	–	9.5	1.06	3.8	4	3.3	2.2	194	192
	405AF	FR	–	–	14	1.16	3.7	4	3.3	1.6	192	192
	407AF	FR	–	–	9	1.1	3.7	4	3.4	2.2	194	192
	40AF	FR,GP	–	–	10	1.16	3.7	4	3.1	2	196	194
	478EF	FR	–	–	12	1.04	3.7	4	3.4	2.2	183	183
	50IS	GP	–	–	7.5	1.03	3.8	5	3.1	1.9	196	189
	50IS-L	GP	–	–	7.5	1.03	4	5	3.2	1.9	196	189
	60HR	HR	–	–	4	1.03	4.1	5	3.1	2.4	199	194
	60HR-G	HR,HFL	–	–	5.5	1.03	3.8	5	3.1	2.4	199	194
	SF-510	HI,HFL	–	–	12	1.04	3.8	5	3.3	2.6	194	194
	SG-910	HGL,HI	–	–	3.7	1.04	4.8	5	3.3	3.1	207	198
	SG-960	HGL,HI	–	–	5.5	1.04	5.1	5	3.6	2.4	199	194
	SG-970	HGL,HI	–	–	6.5	1.04	5.3	5	3.7	2	196	194
	SI-610	HI,HFL	–	–	6.5	1.04	3.8	5	3.1	3.8	205	199
Network Polymers	NPS90-0304	–	–	–	2.4	1.04	4.1	–	3.3	4	180	HB
	NPS90-0645	–	–	–	3	–	–	–	2.1	3	172	HB
	NPS90-0802	–	–	–	8	1.04	–	–	2.8	1.9	178	–
	NPS90-0820	HI	–	–	8	1.04	–	–	2.8	1.9	178	–
	NPS90-0827	–	–	–	8	1.04	–	–	2.9	2.7	178	–
Nova Chemicals	4210/4214	–	–	–	3.5	1.04	5.2	–	4	1	192	HB
	4211	–	–	–	4	1.04	5.8	–	3.8	1	192	HB
	4501	HI	–	–	6.5	1.04	4.2	–	3.5	1.2	189	HB
	5100/5104	HI,ST	–	–	2.7	1.04	3.9	–	3.4	1.8	190	HB
	5124	HGL,HI	–	–	4.3	1.04	3.2	–	3.2	1.9	180	HB
	5190	HGL,HI	–	–	5.5	1.04	4.6	–	3.2	1.8	190	HB
	5511	–	–	–	8	1.04	3.8	–	2.6	2.4	180	HB
	5620	ST,HR	–	–	2.7	1.04	2.9	–	3	1.8	190	HB
	5711	HI,MED,HFL	–	–	15.5	1.04	4.2	–	3.1	1.8	180	HB
	5751	MI,MED,HFL	–	–	18	1.04	3.2	–	3.5	1.5	170	HB
	731G	HI,ST	–	–	4	1.04	3.6	–	2.5	2.2	194	HB
Plastx World	DalcelStyrol GH10	FR,HR	–	–	8	1.15	3.1	–	3	1.8	178	V-0
	DalcelStyrol GW30	FR,UVR	–	–	10	1.16	4.3	–	3	1.2	176	V-0
	DalcelStyrol GW50	FR,UVR	–	–	5	1.16	3.5	–	2.6	1.3	176	V-0
	DalcelStyrol SK50H	FR	–	–	4	1.12	5.5	–	3.7	0.6	167	V-2
	DalcelStyrol SK50	FR,UVR	–	–	4	1.06	4.4	–	3.6	1.5	176	V-2
RTP	400HI-FR	BLK,FR,HI,NAT	–	–	–	1.17	3.3	–	4	1.7	205/175	V-0
	400HI-SI2	BLK,HI,LUB,NAT	–	–	–	1.03	3.1	–	3.2	2	185/170	HB
	401HI	–	10%	–	–	1.11	5	–	5	1.1	210/180	HB
	403HI	BLK,HI,NAT	20% GF	–	–	1.18	6	–	8	1.2	200/190	HB
	405HI	BLK,HI,NAT	30% GF	–	–	1.26	11.5	–	14	1	220/190	HB
	ESD A 400 HI	AST,BLK,IM	CB	–	–	1.1	3.2	2	3.3	1.2	205/175	HB
	ESD A 460 HI	AST,COL,HI	CF	–	–	1.06	6.5	0.6	9.5	1.1	210/180	HB
	ESD C 400 HI	AST,BLK,EC,IM	CB	–	–	1.1	2.6	2	2.8	1.2	205/175	HB
	ESD C 480 HI	AST,COL,EC,HI	CF	–	–	1.08	7	0.6	10	1	210/180	HB
Shuman	810	BLK	–	4-16	–	1.05	4.4	–	–	1.5-2	167	HB
	811	BLK,MI	–	4-15.9	–	1.05	–	–	–	0.2-1.3	190	–
	811/881	BLK,MI,MGL,MOL	–	4-15.9	–	1.1	5.2	–	–	0.9	190	–
	SP610/880	BLK,HI,MOL	–	6-10	–	1.1	4.4	–	–	1.8	167	HB

INJECTION MOLDING *(Continued)*

Manufacturer	Trade Name and/or Grade	Features, Applications	Filler, Reinf. Type	Reinf. %	Melt Flow Rate, g/10 min	Density, g/cc	Tensile Str at Yield, 1000 psi	Tensile Str at Yield, %	Elong. at Yield, %	Flex Modulus, 10E5 psi	Notched Izod Impact, ft-lb/in (1/8 in)	Notched Izod Impact, J/m (3.2 mm)	Deflection Temp, F (66 psi, 264 psi)	UL 94 Rating (1/8 in)
Spartech	SC2-1000U	GP,HST,LUB,UVR	–	–	2.7	–	4.2	–	–	3.7	2	–	–	–
	SC2-1098	GP,HST,LUB	–	–	8.4	–	9	–	–	3.6	0.7	–	–	–
	SC2-1099	GP,HST,LUB	–	–	6.6	–	7	–	–	3.4	1.5	–	–	–
	SC2-1220	GP,HST,LUB	20% GF	–	–	1.19	10.5	–	–	9.5	1.1	–	–	–
	SC2-1230	GP,HST,LUB	30% GF	–	–	1.28	12	–	–	12	1.2	–	–	–
	SC2-12830	CCR,GP,HST,LUB	30% GF	–	–	1.28	12	–	–	12	1.2	–	–	–
TP Composites	HIPS AS	AST	–	–	–	1.06	3	–	–	0.6	1.5	200;170	HB	
	HIPS FR	FR	–	–	–	1.15	2.9	–	–	2.8	1.6	205;190	V-0	
Total Petrochem.	Atofina 825	FCY,HI	–	–	8	–	3.6	50	–	3.4	2	–	–	–

INJECTION MOLDING AND STRUCTURAL FOAM

Nova Chemicals	5500/5504	BLD	–	7	1.04	3	–	3	2	–	185	HB	

STRUCTURAL FOAM

Dow Plastics	Styron 425	GP,HI,MOL	–	12	1.04	4.5	–	–	1.2	–	199	–	
	Styron 487	GP,HI,MOL	–	2.5	1.04	2.3	–	2.4	1.6	–	182;167	–	
	Styron 455C	GP,HI,MOL	–	10	1.04	2.9	–	–	2.7	–	180	–	
	Styron 484C	GP,HI,MOL	–	3	1.04	3.3	–	–	2.7	–	192	–	
	Styron 9087SF	GP,HI,FM	–	–	0.99	–	–	2.8	–	–	183;168	V-0/5V	
	Styron 6515	GP,HI,MOL	–	7.5	1.55	–	–	2.5	1.5	–	185	V-0	
	Styron 657	GP,MED,HR,HFL	–	8	1.04	5.2	–	–	0.3	–	202	–	
	Styron 683	GP,MED,HR,HFL	–	2	1.04	6.2	–	–	0.3	–	216	–	
Nova Chemicals	5540	HGL,HI	–	10	1.04	3.8	–	2.9	1.7	–	188	HB	
	5810	MGL,ST	–	3.5	1.04	4	–	2.6	2.3	–	185	HB	

SAN COPOLYMER

EXTRUSION

EniChem	Kostil B265	CHR	–	18	1.07	9.7	–	5.2	–	–	183	–	
	Kostil B365	CHR,HFL	–	30	1.07	9.6	–	5.1	–	–	183	HB	
	Kostil PD-C265	CHR	–	20	1.08	10.9	–	5.2	–	–	187	HB	
	Kostil PD-C365	CHR,HFL	–	30	1.08	10.6	–	5.2	–	–	187	HB	

EXTRUSION AND INJECTION MOLDING

BASF/Styrenics	Luran 368R	GP,TRP	–	12	1.08	10.9	–	–	0.6	216;208	HB		
	Luran 388S	GP,TRP	–	8	1.08	12.2	–	–	0.6	217;210	HB		
Dow Plastics	Tyril 1000B	CHR,GP,TRP,HR	–	8	1.08	10	–	5.4	0.3	218	HB		
	Tyril 880	CHR,GP,TEN,TRP	–	3.5	1.08	11.9	–	5.9	0.5	216	HB		
	Tyril 880B	CHR,GP,TEN,HR	–	3.5	1.08	11.9	–	5.8	0.6	218	HB		

INJECTION MOLDING

Aoh	SAN900L	–	–	6	1.07	9.9	3	5.9	0.2	196;174	–		
BASF/Styrenics	Luran 358N	GP,HGL,TRP,HFL	–	27	1.08	10.4	–	–	0.6	216;208	HB		
Dow Plastics	DowSan 100	–	–	8	1.07	–	–	5.5	–	214	–		
	DowSan 111	–	–	13	1.07	–	–	5.6	–	213	–		
	Tyril 1011	CHR,MOL,UVR,AUT	–	7	1.08	9.3	–	5.2	0.3	215	HB		
	Tyril 125	GP,BLN	–	25	1.07	6	–	5.9	0.2	212	–		
	Tyril 990	CHR,GP,MOL,TRP	–	8.7	1.07	9.7	–	6.1	0.4	212	HB		
EniChem	Kostil B266	CHR	–	18	1.07	9.7	–	5.2	–	183	HB		

SAN COPOLYMER *(Continued)*

INJECTION MOLDING *(Continued)*

Manufacturer	Trade Name and/or Grade	Features; Applications	Filler; Reinf. Type; %	Melt Flow Rate; g/10 min	Density; g/cc	Tensile Str at Yield; 100% psi	Elong. at Yield; %	Flex Modulus; 100 kpsi	Notched Izod Impact; ft-lb/in (J/m)	Deflection Temp. F (C) @ 66 psi (0.45 mPa)	UL 94 Flame Rating (1/8 in)
RTP	500TFE5	BLK,LUB,NAT	–	–	1.1	10	–	5	0.5	210;200	HB
	501	COL	10% CG	–	1.15	11.5	2	8	0.7	215;205	HB
	501 FR	COL,FR,MST,MDL	10% CG	–	1.39	10	1.5	8	1.1	215;205	V-0
	501 HB	COL,MST,MDL,FLX	10% CG	–	1.15	11.5	2	8	0.7	215;205	HB
	503	COL	20% CG	–	1.22	15	1.5	10	1	220;210	HB
	503 FR	COL,OS,FR,ST	20% CG	–	1.46	14	1.5	12	1	220;210	V-0
	503 HB	COL,OS,MDL,LW	20% CG	–	1.22	15	1.5	1	1	220;210	HB
	503TFE10	BLK,LUB,NAT	20% GF	–	1.3	14	–	10	1	215;205	HB
	505	COL	30% CG	–	1.31	15.5	1.2	14	1	225;212	HB
	505 FR	COL,OS,FR,ST	30% CG	–	1.53	16	1	16	1	225;210	V-0
	505 HB	COL,OS,MST,ST	30% CG	–	1.31	15.5	1.2	14	1	225;212	HB
	506	COL	35% CG	–	1.35	16	1.1	14	1	230;214	HB
	506 HB	COL,OS,ST,TEN	35% CG	–	1.35	16	1.1	14	1	230;214	HB
	507	COL	40% CG	–	1.4	17	1.1	16	1	230;217	HB
	507 HB	COL,OS,ST,TEN	40% CG	–	1.4	17	1.1	16	1	230;217	HB
Schulman, A.	ComAlloy 240-3020	OS,ST,TEN	20% CG	5-15	1.22	15.2	–	12.2	1	220;210	HB
	ComAlloy 240-3030	OS,ST,TEN	30% CG	5-15	1.3	17	–	15	1.1	225;216	HB
	ComAlloy 240-3040	OS,ST,TEN	40% CG	5-15	1.4	18.4	–	18.7	1.1	230;220	HB
	ComAlloy E-13040B	GP	30% GF	2.8	1.3	–	–	14.5	0.7	217;212	–
Spartech	SCB-1090	GP,HGL,HST,LUB	–	–	1.07	9	–	5.1	0.4	–	–
	SCB-1096	GP,HGL,HST,LUB	–	–	1.07	10.5	–	5	0.6	–	–
	SCB-6090	GP,HGL,HST,LUB	–	–	1.07	9	–	5.1	0.4	–	–

STYRENE BUTADIENE BLOCK COPOLYMER

BLOW MOLDING AND EXTRUSION

Chevron Phillips	K-Resin KR06NW	MED,PRN,TRP,DP	–	7.5	1.01	3.7	–	2.1	0.8	–;163	HB

BLOW MOLDING, EXTRUSION AND INJECTION MOLDING

Chevron Phillips	K-Resin KR05	MI,GP,ST,TRP	–	7.5	1.01	3.7	–	2.1	0.8	–;163	HB
Total Petrochem.	Finaclear 520	HI,TF,PKG	–	7.5	1.01	3	200	1.8	15	–	–
	Finaclear 530	LGE,MOL	–	11	1.02	3.6	200	1.9	0.3	149;–	–

EXTRUSION, BLOWN FILM

Chevron Phillips	K-Resin KR10	MI,GP,MED,ST	–	7.5	1.01	3.7	–	2.1	0.8	–;163	HB

EXTRUSION, SHEET

Chevron Phillips	K-Resin KX38	GP,HI,ST,TRP	–	9	1	1.9	–	1.5	–	–;143	HB

EXTRUSION AND INJECTION MOLDING

Chevron Phillips	K-Resin BK10	GP,HI,ST,TF	–	15	1.01	3.1	–	2.2	–	–;144	–
Firestone	Stereon 840A-842A	GP,TRP,BLN	–	8-15	0.96	2	800	–	–	–	–

INJECTION MOLDING

Chevron Phillips	K-Resin KR01	MI,GP,MED,PRN	–	8	1.01	4.4	–	2.2	–	–;170	HB
	K-Resin KR03	MI,GP,MED,ST	–	7.5	1.01	3.7	–	2.1	0.8	–;163	HB
	K-Resin KR03NW	GP,MED,PRN,TRP	–	7.5	1.01	3.7	–	2.1	0.8	–	HB
	K-Resin KR62	GP,HGL,HI	–	6	1.02	4.1	–	2.7	3.5	–;168	–